

June 13, 1950

L. C. CASE
MEANS FOR GUIDING OBJECTS THROUGH
DISPENSING MACHINES

2,511,099

Filed March 1, 1946

3 Sheets-Sheet 1

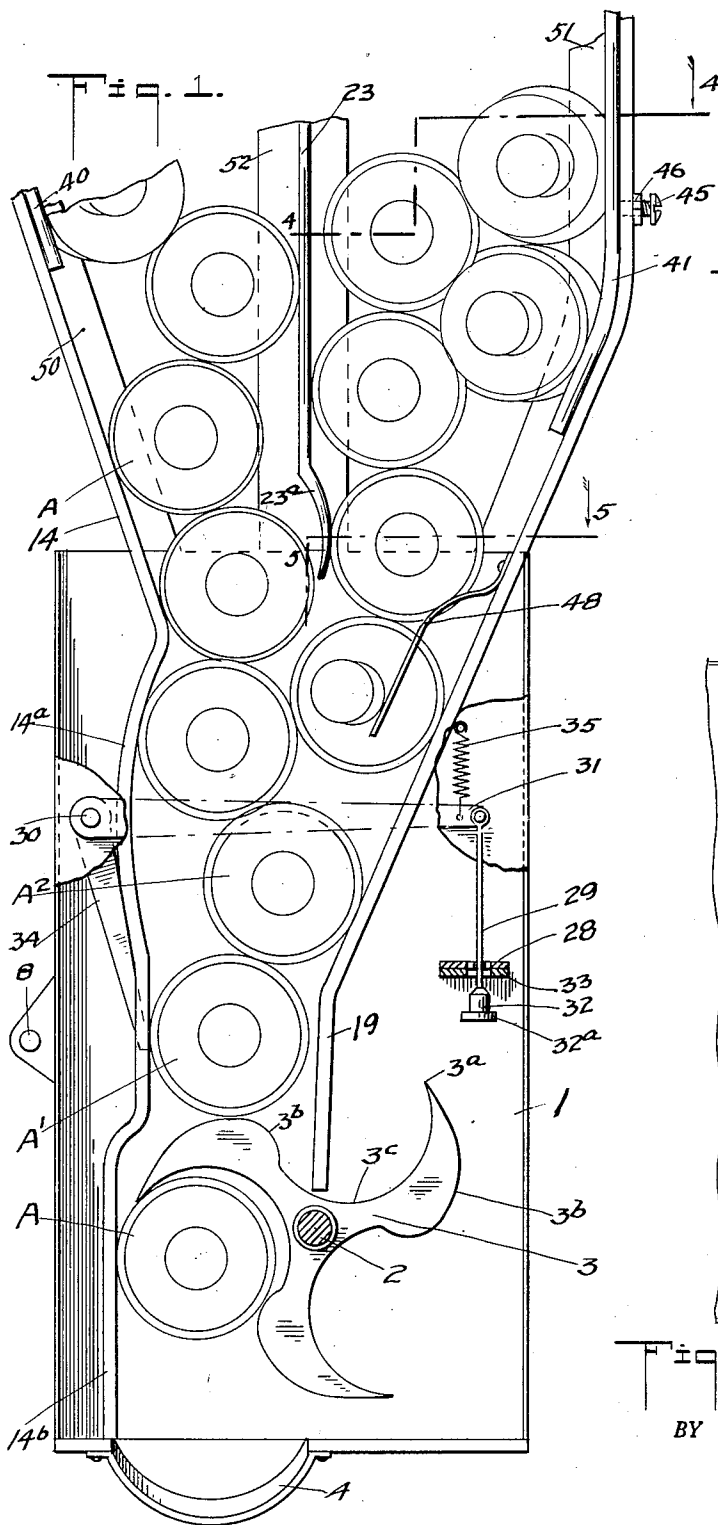
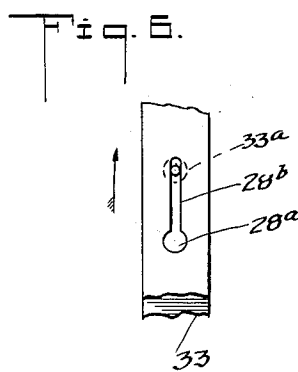
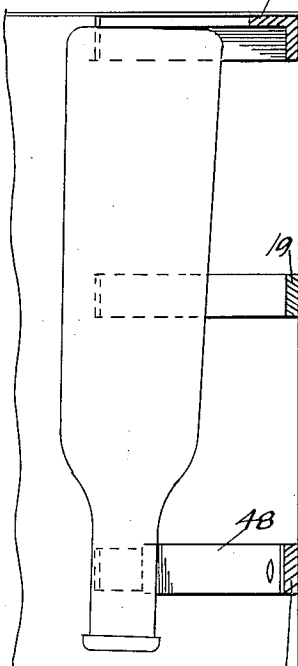


Fig. 5. INVENTOR:
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3 Sheets-Sheet 2

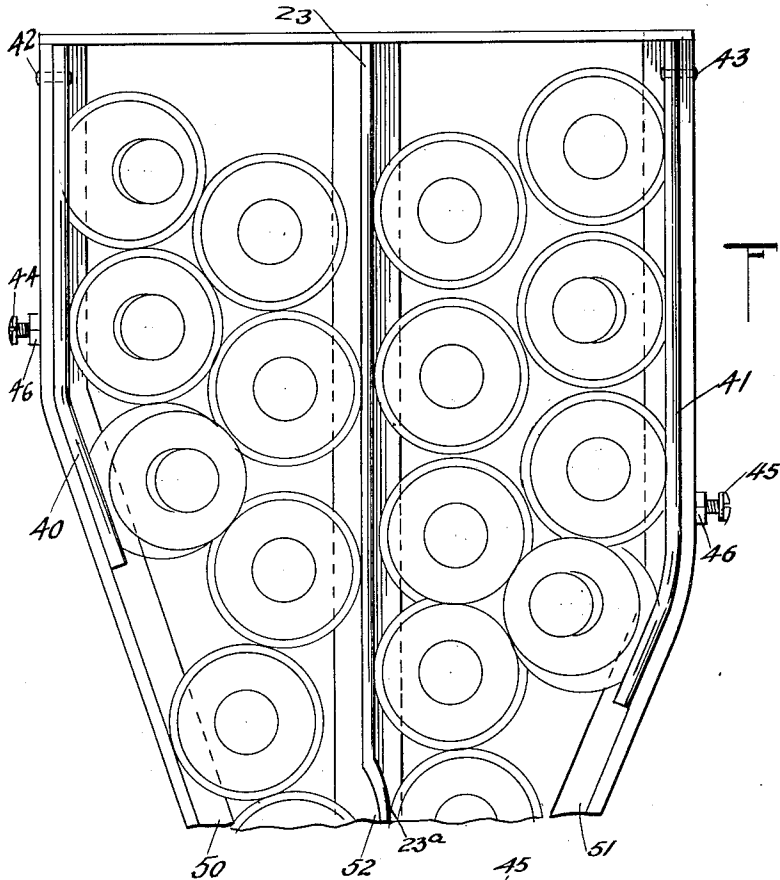


Fig. 1-A.

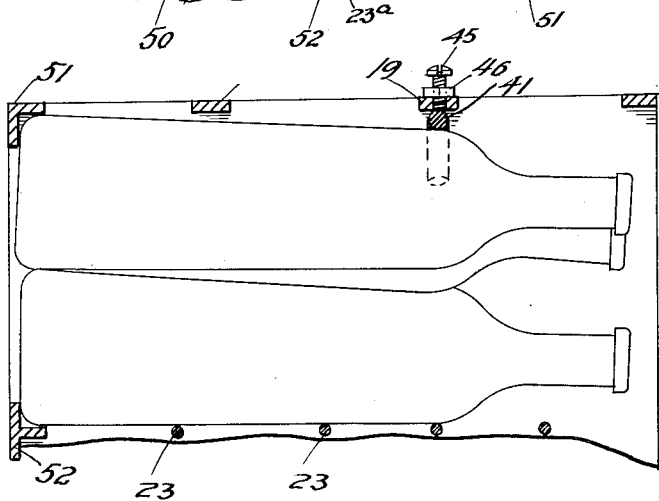


Fig. 4.

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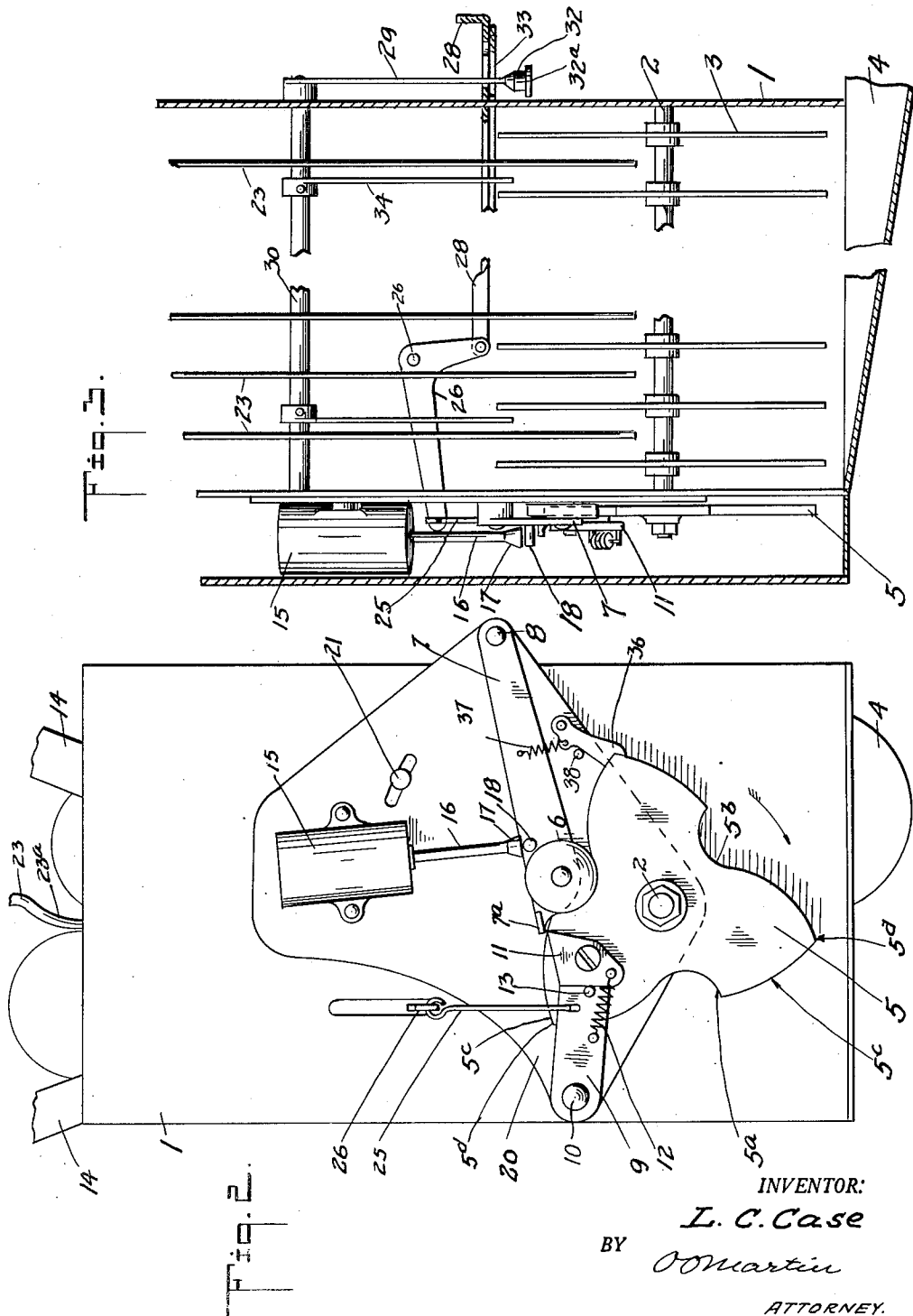
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,511,099

MEANS FOR GUIDING OBJECTS THROUGH DISPENSING MACHINES

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13 Claims. (Cl. 312—48)

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This invention relates to dispensing mechanism for coin controlled vending machines and has particular reference to means of this character adapted to dispense heavy, cylindrical objects, such as filled bottles, cans and the like.

Various types of vending machines are widely used commercially and, in cases where light articles are to be dispensed, have been found very satisfactory. Machines have also been introduced for dispensing heavy objects, such as liquid filled bottles and cans, but such machines as have come to my notice are complicated, expensive and troublesome, in that they frequently get out of order and so defeat their very purpose.

In view of the foregoing, it is the object of my invention to provide a simple, inexpensive and sturdy device which is capable of dispensing such liquid filled containers over a long period of time without attention, except for refilling; which is not liable to get out of order; and which has the capacity to dispense more objects per cubic foot of cabinet space than any other machine that has come to my notice.

Certain difficulties are encountered in dispensing glass bottles, which are not found in connection with cylindrical or rectangular objects such as commonly dispensed from coin operated vending machines. One is the odd shape of a bottle. Because the neck portion of the bottle is so much smaller than the body portion thereof, it is found that the bottles will not remain in their alined sequence as they gradually settle through the casing, but will tend to tilt and twist and so to become jammed together and to obstruct the passage through the machine. This condition is further aggravated by the fact that the bottles vary in size.

It is a further object of the invention to provide guiding means for bottles stored within the machine to the end that the bottles may pass through the machine in smooth, orderly and uninterrupted sequence.

A still further object is to provide means for guiding the cornermost bottle during the dispensing operations thereof in such precise and smoothly controlled manner that vibrations and jars are substantially eliminated.

A further object is to provide a machine in which the coin slide becomes automatically locked before the last object is dispensed, so as to prevent the last coin from entering the machine and so to enable the purchaser to recover his money.

Another object is to provide means designed to prevent tampering with the dispensing mechanism

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of the device by reaching through the discharge opening in an effort to release the nearest object for discharge.

To this end, the invention resides in the combinations hereinafter fully described, and drawings are hereto annexed in which preferred forms of the invention are illustrated.

In the drawings:

Fig. 1 is a front elevational view mainly of the lower portion of the device of my invention with mostly all of the front plate of its casing removed in order to disclose the interior mechanism thereof;

Fig. 1—A shows the upper portion of the device of Fig. 1;

Fig. 2 is a rear view of the lower portion of the device with the rear wall thereof removed;

Fig. 3 is a side elevational view with the near wall of the casing removed for the sake of clearness;

Fig. 4 is a fragmentary plan view taken substantially on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary plan view taken on line 5—5 of Fig. 1; and

Fig. 6 illustrates a portion of the coin control mechanism, the importance of which is hereinafter fully explained.

The device of my invention, in the form illustrated in the drawings, comprises a casing 1, within which is hung a shaft 2, and a series of spider-like members 3 are rigidly secured to this shaft. The three legs of these members, which for convenience hereinafter generally are referred to as the spiders, are shaped to support the objects to be dispensed, in this case bottles A, and to guide the bottles to a delivery tray 4, at the bottom of the casing, in the manner which will now be described in detail.

The rear end of the shaft 2 is fitted with a rigidly affixed star-shaped cam 5, having grooves 5^a shaped to receive a roller 6 which, in turn, is mounted for rotation on the end of an arm 7. The weight of the stored bottles urges rotation of the cam in the direction of the arrow of Fig. 2, but it is held against such rotation by the roller 6. The arm 7 is shown pivotally supported at 8, and it is made at its outer end with a bent lip 7^a. A second arm 9 is shown hung at 10, and it is at its outer end fitted to support a pawl 11, the tip of which rides under the lip 7^a of the arm 7. A spring 12 maintains this pawl projected into the position shown, against a stop 13.

As indicated in Fig. 1, the bottle A is held by one of the legs of the spiders pressed against the left side wall 14 of the casing, ready to drop into

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the delivery tray 4 the moment the spider is released for rotation. Such release is effected by an upward pull on the arm 9 to cause the pawl 11 to swing the arm 7 upward until the roller 6 reaches and passes the corner 5^b of the cam, thereby to release the cam for rotation and so to free the bottle held by the legs of the spiders for delivery into the tray.

It is not, however, safe to permit the piece of merchandise to drop suddenly, particularly where glass bottles are to be dispensed, and it is for this reason advisable to introduce means for controlling the speed of rotation of the released cam and spiders. Such means is here shown in the form of a pneumatic check comprising a dashpot 15, such as commonly used in door checks, and a plunger 16, terminating in a head 17, which rides on a stud 18 of the arm 7. The portion 5^c of the cam, which extends from the corner 5^b thereof, rises on an easy curve until the point 5^d is reached, to impart further rising movement to the roller 6, but as such movement is checked by the plunger 16, it is seen that the bottle is so slowly released that no danger of breakage is present. The plunger is controlled at constant speed with either light or heavy load by relief of compression through a small orifice, in the head of the dashpot, as usual in practice.

At this point, attention is directed to the shape of the spider leg, the point 3^a of which enters between the bottles A¹ and A² as the spider slowly turns to release the bottle A, and it is important to note that the bottle A¹ at the same time rolls along the convex edge 3^c, whereupon the bottle A² rolls along the next following convex edge 3^b. The rotation continues until the bottle A¹ reaches the position previously occupied by the bottle A; the roller 6 drops into the next following groove 5^a; and rotation ceases. It is to be noted that the side walls 14 and 19, of the casing, preferably are made from uniformly spaced, parallel bars or rods and that, in the case of the lower end of the wall 19, such horizontal spacing is necessary in order to provide clearance for spider rotation.

The casing supports a framework high enough to maintain stored therein so large a number of bottles or cans that the weight thereof would, if the objects were free to drop suddenly, be likely to cause breakage. But because the speed of rotation is slowed down, and also due to the curvature of the spider legs, it is found that the dispensing movement of the merchandise is continuously under control so completely that no bumping, jarring, or clashing takes place.

It is in devices such as herein described, necessary to arrange the cam and spiders in correct relation to the casing wall 14, in order for the spiders more firmly to grip the bottle A and properly to release this bottle upon rotation of the cam and spiders, and it may for this reason be found advantageous to mount the above described control mechanism for adjustment relative to the casing. To this end, I have shown all of this mechanism mounted on a plate 20, see Fig. 2, which may be rotated on the shaft 2 until the desired, correct position of the parts thereof is attained. A screw 21 is seated in a slot of the plate 20 to clamp the latter in adjusted position on the casing; or more screws may be added if found necessary.

The height and shape of the storage space is important in order that the greatest number of bottles may be stored in the most compact space

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and in order to make certain that the bottles are guided into the correct position on the spiders. This may conveniently be done by placing a partition, consisting of a series of rods 23, intermediate the spiders, and this partition is so shaped that the stored merchandise is properly guided. Where cylindrical articles are to be dispensed, this arrangement is sufficient to insure smooth and orderly movement, but because bottles are smaller at the neck portion thereof, it becomes necessary to provide additional guiding means therefor.

Such guiding means is, in Figs. 1 and 1—A, shown in the form of rods 40, 41 which are fastened to the top of the casing, as by means of rivets 42, 43; or they may be welded in position thereon, if preferred. These rods are vertically directed to contact the bottles at the place where the body thereof commences to curve inward to form the neck, substantially as indicated in Fig. 4, thereby to force the outer row of descending bottles against the inner row thereof and so to prevent tilting movement thereof. Due to variations in the size of bottles of the same general type manufactured by different firms, it furthermore becomes necessary to adjust the rods 40, 41 to regulate the extent to which the bottles of the outer row gradually are moved against the inner row bottles, and this may conveniently be effected by mounting set screws 44, 45 in the machine frame for contact with the rods 40, 41. When properly adjusted, these screws are locked in position by check nuts 46.

It is noticed that the frame side walls 14 and 19 commence to taper downward from the place where the set screws 44, 45 are placed. The taper of the wall 19 remains uniform until the spider is reached but it is noticed that the wall 14 commences to curve outward, from a point a short distance below the end of the center partition 23, to form a bulge 14^a. This bulge is absolutely essential in order to relieve the pressure against the bottles in their transfer from the two upper compartments to the single lower compartment. Without such relief, the descending bottles would become so tightly jammed together that they could not move. It is also important to note that the lower end of the central partition is bent to the right to form a curved lip 23^a. This offset is also essential in order to equalize the space on both sides of the partition for the descending bottles.

As a final means of preventing the bottles from tipping and also in order to force the bottles descending from the right compartment against and into the line of the bottles descending from the left compartment, I have mounted a resilient bracket 48 on the side wall 19, in position to engage the neck of the bottles settling therealong and to urge them against the bottles of the left row, as the latter recede into the bulge 14^a. The rear corner bars of the frame are shown made in the form of angle bars 50, 51, and a plate or T-bar 52 is centrally positioned in line with the partition rods 23. These bars serve to maintain the bottles in position within the frame. Opposite the spider 3, the side wall is again offset, substantially as indicated at 14^b, to clear the spider and also to permit the bottle to pass. These shapes have been perfected after much experimenting and are essential to intermeshing of columns into a single column and to smooth, bump-free delivery.

Dispensing devices are generally coin operated, but as many types of coin controlled operating

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mechanisms are in commercial use, and as such mechanism may readily be adapted to operate the present dispensing mechanism, it is thought sufficient herein to show a link 25 rising from the arm 9 and pivotally connected at the top to a bell-crank 26. The latter may, as indicated at 27, be connected to the usual coin slide 28. When a coin is placed in this slide, in the conventional manner, it is merely required to push the slide ahead and thereby to release the cam by raising the roller 6 out of the groove 5^a.

In the coin slide 28 is cut a perforation 28^a, from which a slot 28^b extends rearwardly, see also Fig. 6. A rod 29 is held suspended from a shaft 30 by means of an arm 31, and this rod is fitted at the bottom with a head in the shape of an enlarged shoulder portion 32, terminating in a flange 32^a. The slide rests on a suitable shelf 33, such as usually employed, and this shelf is made with a perforation 33^a which takes a position directly below the inner ends of the slot 28^b. It is noticed that the rod 29 extends through this slot and the perforation 33^a.

One or more arms 34 extend downward from the shaft 30 to rest against the bottle A¹, and a spring 35 urges these arms against the bottle and against all the stored bottles as they successively reach this position. However, when the bottle A¹ is the last one left in the machine, above the spiders, and the machine is operated to pass it into the position at A, it is seen that the spring 35 is free to draw the rod 29 upward until the shoulder 32 comes to rest against the edges of the slot 28^b. When thereupon the coin slide again is pushed ahead to release the last bottle, it is found that the shoulder 32 rises through both perforations, 33^a and 28^a to lock the slide in advanced position. The machine is then locked against further operation.

In order to prevent tampering with the machine by reaching through the discharge chute 4 to the spiders, it is well to provide means preventing rotation of the latter in the wrong direction. Such means may take the form of a pawl 36 which, by a spring 37, is held pressed against the point 5^d of the cam. A stop 38 is added to limit forward movement of this pawl. But more elaborate devices may, of course, be substituted.

It should be apparent to those versed in the art that I have provided a simple and inexpensive, gravity actuated mechanism for dispensing bottles from vertical columns. Further, that I have succeeded in merging such vertical columns into a single vertical column from which bottles are dispensed one by one solely by gravity. So far as I know this has never before been accomplished. Saving of floor space is one of the most important considerations in the installation of such coin controlled vending machines and it is important to note that, by the present arrangement of multi-column, vertical storage, a minimum of floor space is occupied. The present machine may, for this reason, be installed in service stations, waiting rooms, and similar cramped quarters without inconvenience to attendants or the public served.

Another feature, above described, is most important. It is stated that the rear wall of the storage space consists of corner angle bars and a central T-bar. By this arrangement, sufficient space is present between these bars for insertion of the bottles. Had the rear wall been solid, as in other machines, it would have been necessary to drop the bottles into the frame from the top thereof and this would result in many broken bot-

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ties. The front wall must, of course, be solid, in order to form a stop for the bottle necks, but this open rear wall makes quick and convenient loading possible.

While I have in the foregoing described a preferred form of the invention, it is not thereby intended to limit the invention to the exact combinations of parts and arrangements of features thereof, but I reserve the right to embody such modifications as will come within the scope of the claims hereto appended.

I claim:

1. A dispensing device for cylindrical objects comprising, a casing having right and left side walls and a discharge opening, a shaft rotatable within the casing, spiders on said shaft shaped to guide said objects to said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said casing walls gradually tapering downward to readjust the stored objects as they settle during the dispensing operation and approach and pass the lower end of said partition and approach said spiders, thereby gradually to merge the objects from the two compartments into a single column, said left wall continuing downward to the discharge opening of the casing at the left side of the spiders, the right casing wall terminating at the bottom directly above the spider shaft substantially in continued alignment with the said partition.

2. A dispensing device for cylindrical objects comprising, a casing having right and left side walls composed of vertical uniformly spaced rods and a discharge opening, a shaft rotatable within the casing, spiders on said shaft shaped to guide said objects to said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said walls gradually tapering downward to readjust the stored objects as they settle during dispensing operations and approach and pass said partition and approach said spiders, thereby gradually to merge the settling objects into a single column, said left wall continuing downward to the discharge opening at the left side of the spiders, the right casing wall terminating directly above the spider shaft substantially in continued alignment with said partition.

3. A dispensing device for cylindrical objects comprising, a casing having side walls and a discharge opening, a shaft seated for rotation within said casing, spiders on said shaft shaped to guide said objects to the said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said casing walls gradually tapering downward to readjust the stored objects as they settle during dispensing operations to approach and pass the lower end of said partition and to approach said spiders, thereby to cause the objects gradually to merge into a single column, said partition being at the bottom offset somewhat in order to equalize the space on both sides of the partition so as to afford the objects of both columns space to pass below the partition.

4. A dispensing mechanism for bottles comprising, a casing having side walls and a discharge opening, a shaft seated for rotation within said casing, spiders on said shaft shaped to guide said bottles to the said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said casing side walls gradually tapering downward to readjust the stored bottles as they settle during the

dispensing operations of the mechanism to approach and pass the lower end of said partition and approach said spiders, thereby to cause the bottles gradually to merge into a single column properly directed to the spider legs, and means mounted on the said side walls for directing the neck end of each bottle inward so as to prevent tilting of the bottle as it passes beyond the lower end of said partition.

5. A dispensing mechanism for bottles comprising, a casing having side walls and a discharge opening, a shaft seated for rotation within said casing, spiders on said shaft shaped to guide said bottles to the said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said casing walls gradually tapering downward to readjust the stored bottles as they settle during dispensing operations of the mechanism to approach and pass the lower end of said partition and approach said spiders, thereby to cause the bottles gradually to merge into a single column properly directed to the spider legs, and means adjustably mounted on the said side walls for directing the neck end of each bottle inward so as to prevent tilting of the bottle as it passes beyond the lower end of said partition.

6. A dispensing mechanism for bottles comprising, a casing having right and left side walls and a discharge opening, a shaft seated for rotation within said casing, spiders on said shaft shaped to guide said bottles to the said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said casing walls gradually tapering downward to readjust the stored bottles as they settle during dispensing operations of the mechanism to approach and pass the lower end of said partition and approach said spiders, thereby to cause the bottles gradually to merge into a single column properly directed to the spider legs, and resilient means mounted on the right side wall of the mechanism in position to engage the necks of the bottles descending therealong and to force the bottle necks inward yieldingly to cause the bottles to merge into the row of bottles descending from the left compartment of the mechanism.

7. A dispensing mechanism for bottles comprising, a casing having right and left side walls and a discharge opening, a shaft seated for rotation within said casing, spiders on said shaft shaped to guide said bottles to the said opening, a vertical partition above said spiders dividing the casing into two storage compartments, the said casing walls gradually tapering downward to readjust the stored bottles as they settle during dispensing operations of the mechanism to approach and pass the lower end of said partition and approach said spiders, thereby to cause the bottles gradually to merge into a single column properly directed to the spider legs, and resilient means mounted on the right side wall below said partition to engage the necks of the bottles descending thereon and so to assist in further urging said bottles inward as they merge into the row of bottles descending from the left compartment.

8. A dispensing mechanism for bottles comprising, a casing having right and left side walls and a discharge opening, a shaft seated for rotation within said casing, spiders on said shaft shaped to guide said bottles to the said opening, a vertical partition above said spiders dividing into two storage compartments, the said casing side walls gradually tapering downward to

readjust the stored bottles as they settle during the dispensing operations of the mechanism to approach and pass the lower end of said partition and approach said spiders, thereby to cause the bottles gradually to merge into a single column properly directed to the spiders legs, the left side wall curving outward below the end of said partition to relieve pressure due to the merging of the bottles into a single column and so to prevent jamming thereof, the bottom end of the left side wall being outwardly offset to provide space for the bottles as they are delivered to the discharge opening by the spiders, and means mounted on the said side walls for directing the neck end of each bottle inward so as to prevent tilting of the bottle as it passes beyond the lower end of said partition.

9. A gravity actuated mechanism for dispensing bottles comprising, a frame divided at the upper portion thereof into two parallel vertically directed compartments, the side walls of said compartments converging downwardly to merge the compartments into a single vertically directed compartment, the said compartments being shaped to receive bottles to be held horizontally therein with the bottoms of the bottles directed towards the rear of the compartments, bars at the outer rear corners and at the center division between said compartments for holding and guiding the bottoms of the bottles and to maintain the bottles in position within the compartments, there being vertically directed spaces between said bars for insertion of the bottles, and means below said single compartment shaped to receive bottles from the compartment one by one, said means being gravity actuated to dispense the bottles therefrom.

10. A gravity actuated mechanism for dispensing bottles comprising, a frame divided at the upper portion thereof into two parallel vertically directed compartments, the side walls of said compartments converging downwardly to merge the compartments into a single vertically directed compartment, the said compartments being shaped to receive bottles to be held horizontally therein with the bottom of the bottles directed towards the rear of the compartments, bars at the outer rear corners and at the center division between said compartments for holding and guiding the bottoms of the bottles and maintaining the bottles in position within the compartments, there being vertically directed spaces between said bars for insertion of said bottles, means vertically mountable on the side walls of the compartments engaging the bottles and urging the front portions thereof inwardly, thereby to aid in merging the bottles into a single column within said single bottom compartment, and means below said single compartment shaped to receive bottles from the compartment one by one, said means being gravity actuated to dispense the bottles.

11. A gravity actuated mechanism for dispensing bottles comprising, a frame divided at the upper portion thereof into two parallel vertically directed compartments, the side walls of said compartments converging downwardly to merge the compartments into a single vertically directed compartment, the said compartments being shaped to receive bottles to be held horizontally therein with the bottom of the bottles directed towards the rear of the compartments, bars at the outer rear corners and at the center division between said compartments for guiding the bottoms of the bottles and maintaining

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the bottles in position within the compartments, there being vertically directed spaces between said bars for insertion of the bottles, adjustable means vertically mountable on the side walls of the compartments in position to engage the bottles and to urge the front portions thereof inwardly, thereby to aid in merging the bottles into a single column within said single bottom compartment, and means below said single compartment shaped to receive bottles therefrom one by one, said means being gravity actuated to dispense the bottles.

12. A dispensing device for cylindrical objects having right and left side walls and a discharge opening, a shaft seated to rotate within the device, spiders on said shaft shaped to guide said objects to the said opening, a vertical partition above said spiders dividing the space between said walls into two storage compartments, the walls gradually tapering downward to readjust the objects as they settle during the dispensing operations to approach and pass said partition and to approach said spiders, thereby to cause the objects gradually to merge into a single column, said partition being at the bottom offset somewhat in order to equalize the spaces on both sides of the partition and so to afford the objects of both columns space to pass below the partition, the left side wall being below said offset portion outwardly curved in order to afford freedom for the objects to merge without jamming.

13. A dispensing device for cylindrical objects having side walls and a discharge opening, a

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shaft rearwardly extending through and seated for rotation within the device, spiders on said shaft shaped to guide said objects to the said opening, means checking rotation of said spiders, a coin slide manually movable to release said rotation checking means and having a slot therein with an enlarged portion at one end thereof, a frame mounted on the device for engagement by the objects passing therethrough, a member hung on said frame and extending through said slot, said member terminating in an enlarged head, resilient means urging said frame into contact with the passing objects, the frame being moved by said resilient means after the last object passes the frame to move said rod and thereby to cause the head thereof to lodge within the enlarged portion of said slot and so to lock the slide against movement.

LESLIE C. CASE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
579,330	Peterson	Mar. 23, 1897
614,553	Jaeger	Nov. 22, 1898
627,505	Jaeger	June 27, 1899
909,100	Linde	Jan. 5, 1909
1,327,058	Ogden	Jan. 6, 1920
1,460,574	Coseglia	July 3, 1923
2,100,752	Scheurer	Nov. 30, 1927
2,399,105	Donaldson	Apr. 23, 1946